

# Engineering & Computer Science *BITS*

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## Faculty signs letter of Agreement with Technion-Israel Institute of Technology

***Agreement calls for collaboration in the areas of teaching and research***

From February 22-27, 1997 Dr. Donat J. Taddeo, Dean of the Faculty of Engineering & Computer Science at Concordia University, and Dr. Paul Fazio, Director for Concordia's Centre for Building Studies (CBS), took part in the Canadian Trade Mission to Israel spearheaded by the Honourable Art Eggleton, Canada's Minister of International Trade.

During the course of this visit both Dean Taddeo and Dr. Fazio met with the Organizing Committee on the Second International Congress on Intelligent Buildings and, along with other delegation members, visited the Shalom Project now under construction in Tel Aviv. This project, developed under the leadership of Montreal developer David Azrieli and constructed by Magil Construction headed by Mr. Sol Polachek, is the largest development project ever undertaken in Israel and in the Middle East. Both Mr. Azrieli and Mr. Polachek have strong connections to Concordia. Mr. Azrieli has helped fund the University's Graduate Fellowships and established the David J. Azrieli Holocaust Collection,



(left to right) Dr. Paul Fazio, Dean Donat J. Taddeo, Minister Art Eggleton and Dr. Zehev Tadmor

the world's largest collection of holocaust literature, housed within Concordia's J.W. Mc Connell Library. Mr. Sol Polachek, Chairman and CEO of Magil Laurentienne, is a former External Advisory Board member for the Faculty of Engineering & Computer Science.

Extensive meetings were also held at the Technion-Israel Institute of Technology between the Concordia University delegates and the Deans from the Faculties of Civil Engineering and Architecture as well as

research team members from the National Building Research Institute (NBRI) at Technion.

As a result of these meetings, under the auspices of Minister Eggleton and in the presence of the Canadian Trade Delegation, an agreement of cooperation was developed between Concordia's Centre for Building Studies and the Faculty of Engineering & Computer Science and the Faculty of Civil Engineering and the NBRI at Technion.

Signed by Professor Zehev Tadmor, President of the Technion- Israel Institute of Technology, and Dean Taddeo from Concordia University, this very important agreement calls for collaboration in the areas of construction management and the physical performance of buildings. In addition, both institutions will establish collaborative research activities and publications and will help foster the exchange of information in joint fields of interest as well as in the exchange of faculty members and students for study and research.

Within the context of this agreement, the CBS has invited a faculty member from Technion to spend his sabbatical year with Concordia in 1997-98.

# State-of-the-art Digital Media, Animation, and Research Complex planned for Concordia

## University's Capital Campaign strives to raise funds for this unique inter-Faculty project

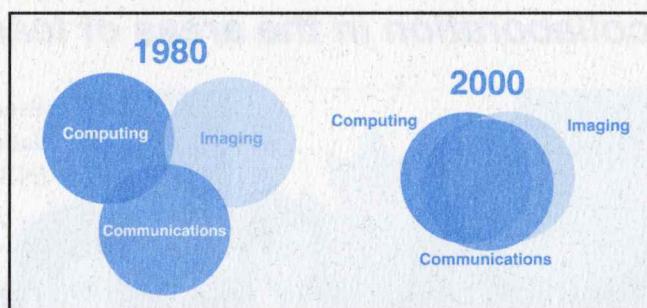
In keeping with Concordia's tradition of carving out new and unique programs geared towards innovation, the University has initiated plans for the development of a Digital Media Animation and Research Complex which would bring together in shared programs and facilities students, professors and researchers in Fine Arts, Communication Studies and Computer Science. Dr. Clement Lam, Chair of the Department of Computer Science believes this initiative will help define Concordia as a university on the cutting-edge of innovative education.

"This effort is a unique case where three disciplines will pool together their resources and expertise to develop fresh new programs and facilities".

Specifically, the project calls for the creation of a digital media laboratory which will allow students to work in the areas of video editing, digital post-production for film, multimedia systems, CD-ROM authoring, digital image design, virtual reality and many other related areas.

A digital animation and research laboratory would also be developed wherein students would integrate computer programming and digital media skills with traditional fine arts creative practices. According to Dr. Lam, this effort would also provide ample opportunity for researchers and scientists to collaborate on numerous projects within the University and with industry. "The synergy created between scientists in different fields will open doors to new areas of research".

The establishment of a Chair in Multi-media would also be required to ensure that multimedia education offered within the program would be supplemented with leading-edge research and development. The Chair would be funded through the current NSERC mechanism for industrial chairs.



This initiative would provide students with a new and innovative program in keeping with the University's mission of real education for the real world and will allow students to benefit from the expertise of all three disciplines while learning the appropriate skills required to succeed in the ever-expanding multi-media field.

This strategic cross-Faculty alliance is completely revolutionary and places Concordia at the forefront of multimedia education, design and conception in Canada. According to Professor Lynn Hughes, Associate Dean of academic programs in the Faculty of Fine Arts, this alliance has generated an extremely positive environment within the University. " This collaboration has allowed Concordia to move beyond the *territorial* attitude generally exhibited by faculties in most universities. There is a genuine desire for co-operation between all three disciplines and Concordia is moving quickly to ensure this union". The setting for the introduction of this unique initiative is ideal with the

province of Québec boasting a healthy multimedia industry with such companies as Microsoft's Soft Image, CAE and Discreet Logic. The employment opportunity for graduating students as well as the opportunity for potential research collaboration between Concordia and local industry is tremendous.

One recent development which has already taken place and will help pave the way for the establishment of this project is the creation of a Double Major in Fine Arts and Computer Science in May 1996 aimed at providing students with a synthetic under-

standing of computer knowledge and artistic studies. This university-level program offers a full undergraduate in-depth scientific and artistic education in computer science and fine arts.

The merging intersections of communication, art and computer science offered through courses stemming from this project are limitless. Many of these courses now exist and many more will be developed through the use of these laboratories, focusing on the issues and concerns of the 21st century artist, communicator and computer scientist. Obvious potential exists for Concordia to further strengthen its position as one of Canada's top schools in the area of multimedia education through the realization of this project.

As it stands, the project has officially been placed on the University list of immediate needs for the Capital Campaign initiative after being approved by Senate and the Board of Governors.

# Study on Building Reingestion of Pollutants Underway

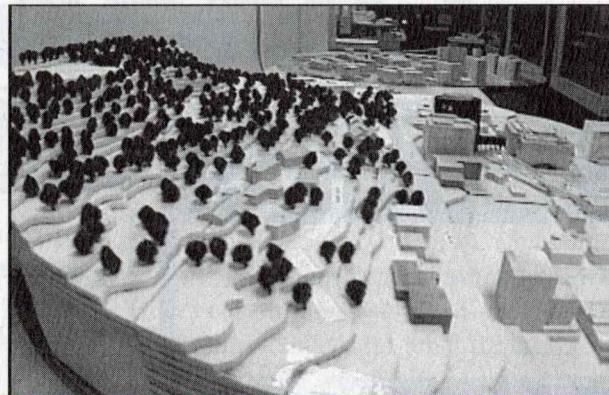
**Researchers at Concordia's Centre for Building Studies obtain IRSST Grant towards Urban study**

Researchers at Concordia's Centre for Building Studies (CBS) are currently studying the problem of pollutant reingestion by buildings in the urban environment.

Drs. Ted Stathopoulos and Pat Saathoff have been conducting research in this area since 1972, when they helped McGill University look into odour problems within their Biology and Medical buildings. According to Dr. Saathoff the problems experienced by many buildings in urban areas lie in the fact that their stacks are at an inappropriate height and, as a result, their expelled pollutants may be reingested through their vents or through those of neighbouring buildings. The close proximity of buildings within the urban environment coupled with wind effects, causes fumes to be reingested rather than expelled into the atmosphere, as would be the case in a less concentrated rural area. "The idea is to maintain stacks which are high enough to allow pollutants to be expelled directly into the atmosphere rather than left to accumulate in pockets between buildings. The other alternative is to increase the force or velocity at which pollutants are expelled, in the case of buildings whose stack height does not surpass the height of neighbouring buildings".

Both Dr. Stathopoulos and Dr. Saathoff have recently been awarded an 18-month grant by *l'Institut de recherche en santé et en sécurité du travail du Québec (IRSST)* to conduct a full-scale study of the problem. Previously, all data obtained regarding the reingestion of pollutants by buildings and the associated wind effects were obtained from simulations run through the University's wind tunnel. Naturally, there are many variables which could affect data in a full-scale study which may not be present under a controlled simulation. This marks the first time such a study will be conducted.

The grant, totalling over \$101,000 was awarded in order to test the accuracy of the wind tunnel by comparing its data with findings to be obtained from the full-scale study. By comparing the two sets of data, researchers at CBS will be able to determine what changes, if any, need to be implemented in their simulations. According to Dr. Saathoff, a full-scale study is really the only way of validating the wind tunnel. He and Dr. Stathopoulos also hope to use this data to improve upon the American



Model of McGill campus and Mount Royal used by researchers at Concordia's wind tunnel in 1992

Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) standards which presently regulate certain building features (such as stack height) with regard to pollutant reingestion. Initial data upon which these standards were based came from wind tunnel simulations. Since a full-scale study could yield varying results, this may lead to the alteration of present standards.

Researchers are in the process of selecting two buildings as subjects for their full-scale study, one from Concordia and another located in the downtown core.

*For further information please contact Dr. Ted Stathopoulos at (514) 848-4211 or Dr. Pat Saathoff at (514) 848-8772*

## Enterprising Students Finish 1st at Quebec Engineering Competition

**Class project helps establish unique business for three Concordia Students and their family**

Andrea Zaccagnino and his two brothers, Giuseppe and Stefano, epitomize what hard work and some good market research can do for you. Not only did their project on the Manufacturing of Foam Cover Hangers win the Entrepreneurial Design category at this year's Quebec Engineering Competition (QEC), it is also the centre of a booming family business responsible for churning out over 50,000 cover hangers per day. The only Canadian company of its kind, Nettuno ASG sells its products across Canada, the U.S.

and Europe (Italy). The trio have taken their individual expertise and concretized it into a profitable and viable business.

Andrea is a recent graduate from Mechanical Engineering at Concordia and is solely responsible for the project's design. "My brothers and I had this idea before. I just decided to use it to fulfill the course requirements for ENGR 481. Essentially, the entire design was created within this course". Giuseppe studies Industrial Engineering at Concordia and focuses on the production aspects of the project

while Stephano, a graduate from Commerce & Administration, deals with the business side of the venture.

In March, the brothers entered the project in the Canadian Engineering Competition held in Moncton, New Brunswick but fell just short of placing in the top three.

Andrea plans on returning to Concordia for a graduate degree in Engineering to help improve his skills and knowledge which he will in turn be able to use to help the company develop further.

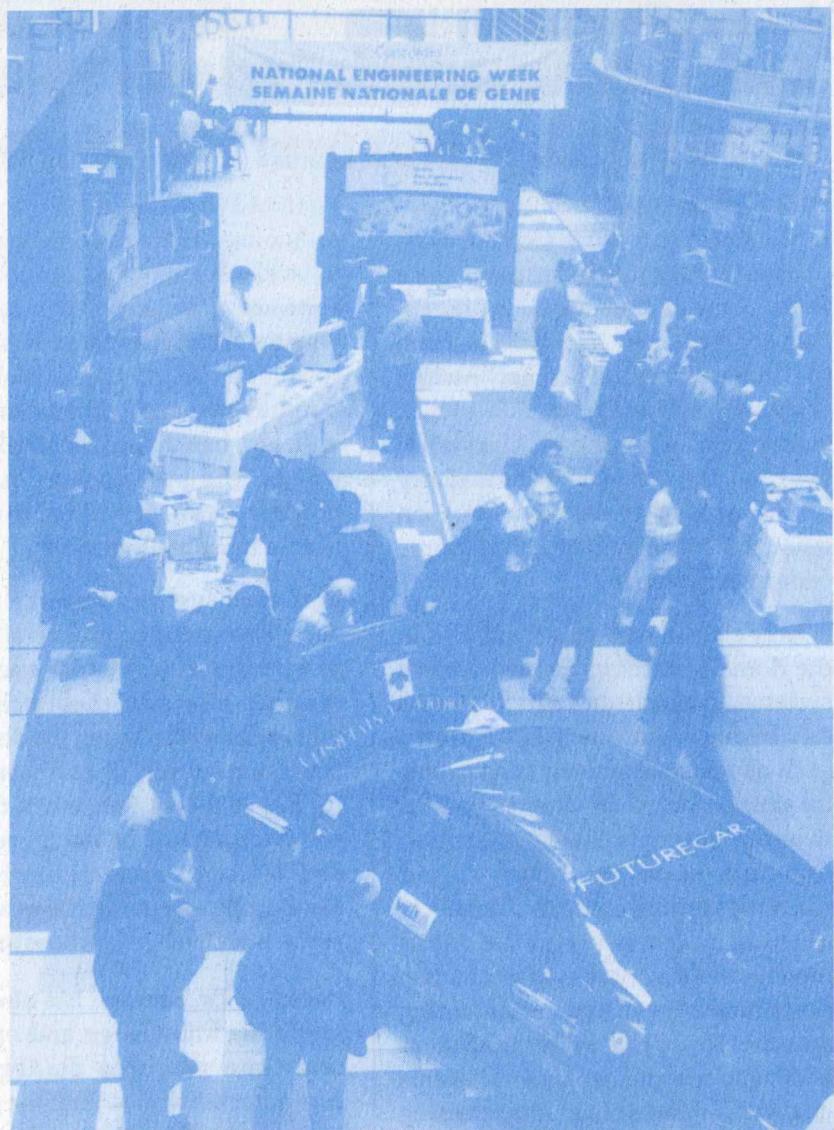
# Faculty Helps Promote National Engineering Week

**University Student Associations and local industry participate in week-long celebration**



March 2-9, 1997 was designated National Engineering Week across Canada and Concordia helped contribute to this national event with numerous activities throughout the week. This initiative, sponsored by the Canadian Council of Professional Engineers (CCPE), the Association of Consulting Engineers of Canada, the Engineering Institute of Canada and the Canadian Academy of Engineering, is aimed at increasing public awareness with regard to the important role engineering plays in everyday life as well as to help encourage young students to consider engineering as a potential career choice.

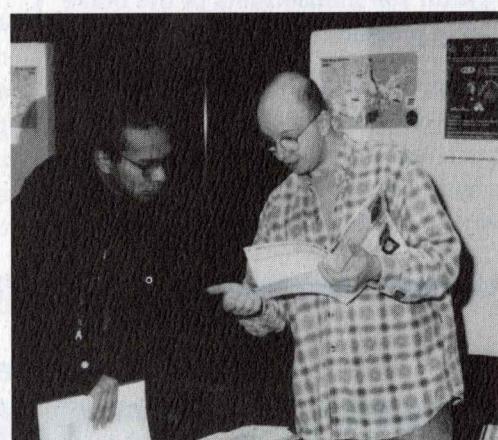
Faculty student associations along with representatives from the Montreal professional engineering industry set up displays in the atrium level of the library building. Companies such as CAE, Nortel and Ericsson not only helped inform numerous non-engineering students about their activities, but were also in place to help recruit potential engineering students. "The benefits are two-fold", stated Remo Marini, VP External for the Engineering & Computer Science Student Association (ECA) and chief organizer of the event. "Not only does this opportunity give companies exposure to a young consumer market, it also helps out engineering students by putting them in direct contact with large engineering companies who may be looking for potential employees or interns".



Also present were representatives from *l'Ordre des ingénieurs du Québec* (OIQ) and *l'Association québécoise pour la maîtrise de l'énergie* (AQME).

Besides association displays, engineering students were also active in organizing a blood drive from March 3-4 and were also involved in a collaborative effort with École Polytechnique and ETS in the *Au Coeur du génie* project. This initiative gathered students from all three schools to help paint several Montreal-area shelters for the homeless on Sunday, March 2. Students were also treated to a tour of the Lockheed-Martin facilities on March 3.

*For further information regarding National Engineering Week please contact the ECA at (514) 848-7408 or Remo Marini via e-mail: remo\_ma@alcor.concordia.ca*



# Real-Time Computer Systems Specialist helping improve video data transfer over the Internet

Dr. Manas Saksena has been an Assistant professor with Concordia's Computer Science Department since 1994. Born in Lucknow, India, Dr. Saksena obtained his B.Tech. from the Indian Institute of Technology (Kanpur) and his Master's and Ph.D. from the University of Maryland. His Ph.D. thesis as well as the majority of his present research focus on resource management in real-time computer systems.

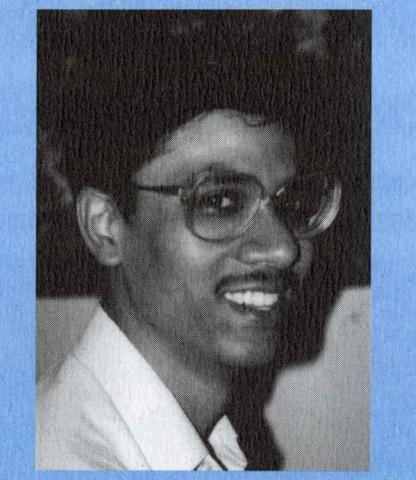
A large class of real-time systems is in the domain of computerized control systems. Examples of control systems can be found in everyday features such as the mechanisms responsible for cruise control in cars, as well as in more sophisticated application domains such as robotics, and industrial process control. The role of a control system is to regulate one or more external variables to meet a pre-determined level (e.g., maintaining automobile speed at 90km/hr), as well as to respond to external events in a timely manner (e.g., stop cruising within 100 milliseconds of the brake being pressed).

In a complex control system, such as those developed by Dr. Saksena, many such variables may be controlled, and the system may have to respond to numerous different types of events.

With advancements in computing technology, there is an increasing trend to tackle this growing complexity using software. However, when such control systems are implemented in software, the resources (e.g., cpu time) must be carefully managed, otherwise the system will not behave as desired. In other words, the system may not exhibit proper control, or will fail to respond to events in a timely manner.

Real-time systems research in the last decade has resulted in several techniques to manage resources for such types of systems. However, these techniques are often applied too late in the development process resulting in costly, ad-hoc fine tuning of the system when the desired behavior cannot be achieved. Dr. Saksena's recent research has focused on developing a systematic methodology to replace such ad-hoc procedures.

Recently, Dr. Saksena has also begun to apply his knowledge and expertise in real-time resource management to computer networks. With the emergence of new multimedia applications such as video-conferencing and video-on-demand, the computer networks are being adapted to handle their performance requirements, which impose somewhat similar resource management requirements as the real-time systems. This is due in large part to



the fact that the presentation of video requires that video frames be displayed at regular intervals (e.g. 30 frames/sec) to obtain a perception of continuity of motion. A failure to do so will result in jerkiness of movement and degrades the video quality. When multiple video streams are transmitted over a shared network channel, the channel band-width must be managed carefully to avoid problems of getting poor and inconsistent quality of video.

Dr. Saksena is presently exploring mechanisms to manage shared network resources such as bandwidths, within the framework of current and proposed Internet technology. The improvement of this transfer of data is vital to the multimedia industry and is an important step towards perfecting data transfer across the information highway.

## Spring 1997 NSERC Results

### Grants By Department

Department	Operating Grants		Total \$ *	Equipment Grants	Total \$
	NEW	RENEWED			
CBS	3	11	\$263,600	2	\$51,952
CIVIL	3	4	\$146,340	0	-----
COMP. SCI.	9	18	\$528,100	0	-----
ECE	17	9	\$591,632	2	\$86,050
MECHANICAL	13	15	\$515,095	0	-----
<b>Total</b>	<b>45</b>	<b>57</b>	<b>\$1,044,767</b>	<b>4</b>	<b>\$138,002</b>

\* Does not include pending conditional grant amounts

### % Eligible Faculty Holding On-Going Grants

Department	% of Eligible Faculty
CBS	100%
CIVIL	78%
COMP. SCI.	89%
ECE	95%
MECHANICAL	91%
<b>Total</b>	<b>91%</b>

# FACULTY NEWS

## 1997 Bell Montreal Regional Science Fair

Once again the Faculty helped support this grass-roots event aimed at encouraging the efforts of young scientists and engineers. Montreal-area high school students gathered at Centennial Regional High School from March 9-11, 1997 to display innovative science and engineering projects. The Faculty presented the \$3,000 "Bridging the Millenia" travel assistance award to **Angel Kumar** from Queen of Angels Academy and **Faisal Ahmad** from Loyola High School who will represent Montreal at the 48th International Science and Engineering Fair in Louisville, Kentucky from May 10-16.

## Alumni Recognition Award Recipients

The Faculty would like to congratulate both **Dr. Venkatanarayana Ramachandran** and **David Janssen** who were recently honoured with Concordia's prestigious Alumni Recognition Award. Dr. Ramachandran was presented with the Alumni Award for Excellence in Teaching and David Janssen with the Outstanding Student Award.

## Engineering & Computer Science

# BITS

is a quarterly publication of the Faculty's Communications Office distributed free of charge to the members of the Engineering & Computer Science community.

## Dean Designate Esmail Visits Faculty

From March 20-21, 1997 **Dean Designate Esmail** visited the Faculty where he met with **Dean Donat J. Taddeo**, the Decanal team as well as faculty, students and staff. During his two-day trip Dr. Esmail toured the various departments and met with departmental Chairs as well as student representatives from the ECA and ECSGA and sat in on Executive Committee and Faculty Council meetings. He begins his five-year term as Dean of the Faculty on July 1, 1997.

## Canada - France Aerospace Workshop

From May 13-15, 1997 Concordia will be hosting the Canada - France Aerospace Workshop. This workshop is part of a cooperative initiative between the National Committee of Deans of Engineering and Applied Sciences of Canada and *la conférence des grandes écoles de France*.

The workshop's primary aim is to bring together universities, industries, government agencies, and other parties interested in setting-up cooperative aerospace research projects directly benefiting the economic and educational systems of both participating countries.

Workshop topics will focus on aero-

## 1997 IEEE AP-S International Symposium and URSI North American Radio Science Meeting

From July 13-18, 1997 **Dr. Stanley Kubina**, Associate Dean Strategic Planning and Director of Concordia's EMC Laboratory, will be co-chairing the 1997 IEEE International Symposium and URSI North American Radio Science Meeting. The Symposium is being held at the Queen Elizabeth Hotel where over 1300 papers will be presented by authors from North America and around the world on current technological progress in the field. 15 daily technical sessions will accompany these presentations throughout the week. Over 1500 participants are expected to attend this symposium which takes place in Canada once every five years.

Those interested in attending may register electronically via the internet at <http://www.nrc.ca/confserv/apsursi97/welcome.html>

nautics and propulsion, materials and structures, acoustics and vibrations, flight controls and avionics, aerospace education/training as well as flight simulation and modeling.

*For further information please contact Ms. Leslie Hosein at (514) 848-4171 or via e-mail: [hosel@vax2.concordia.ca](mailto:hosel@vax2.concordia.ca)*

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